SECTION III – CURRENT SYSTEMS AND OPPORTUNITIES

A. INTRODUCTION

The objective of this section is to provide a thorough understanding of the State's current voter registration, election systems, and related needs. In addition, this section discusses the manner and extent to which information technology is currently applied in the voter registration business functions within the State system. ***Bidders are in no way bound to the current technology or applications used within the Secretary of State (SOS) Information Technology (IT) office and are encouraged to propose the best business solution to meet the business need.*** This section is divided into the following subsections:

- Business Program, Functions, and Background
- Business Problem and Opportunities
- Customers and Users
- Current Technical Environment and Existing Infrastructure

B. BUSINESS PROGRAM, FUNCTIONS, AND BACKGROUND

The following overview describes the State's current voter registration functions and processes. This overview includes a brief description of the manual and automated processes that support the program.

Currently, voter files are maintained separately by the elections official of each of the 58 counties. Voter information is keyed or scanned into the county databases. Information in the voter file is used for a variety of purposes including:

- Determining in which precinct and political subdivision the voter resides based on voter's address;
- Determining a voter's eligibility to participate in a particular election, and the appropriate ballot style;
- Processing of absentee and provisional ballots;
- Calculating precinct size and drawing precinct lines;
- Determining district boundaries for political subdivisions within jurisdictions;
- Producing precinct rosters;
- Tracking absentee voters and mailed absentee ballots;
- Providing voter registration information to individuals and organizations eligible to receive this information;
- Conducting county residency confirmation, sample ballot, absentee voter applications, and other mailings;
- Hiring precinct workers, who must be registered voters;
- Verifying that a candidate is registered with the party they are running under and is a resident of the jurisdiction in which they are seeking nomination/election;
- Verifying signatures on petitions for initiatives, candidate nomination and similar instruments to ensure that the signer is a registered voter for the appropriate jurisdiction, has not already signed the same or a competing petition, and that the signature appears to match that of the registered voter.
- Providing lists for jury pool selection; and
- Processing and making notation of miscellaneous communications with voters (e.g., telephone calls, voter comes to office, etc.).

SOS maintains the official statewide database of all active voters, supported by the Calvoter Statewide Voter Registration and Election Management System (Calvoter). Calvoter contains a copy of the county voter records, kept current by daily updates from the counties. New voter records cannot be entered directly into Calvoter. Additions, changes, and deletion of voter information identified by the Calvoter system cannot be applied directly to the Calvoter database. Calvoter is updated once the counties have researched the changes, applied them to their databases and then sent their extracts to the Calvoter system in an update.

The existing Calvoter system was augmented during late 2005 with the development of a series of external automated processes. These processes, known collectively as the "interim enhancements," were added to achieve an interim level of compliance with the Help America Vote Act of 2002 (HAVA), as required by agreement with the United States Department of Justice (USDOJ) to avoid threatened litigation for the State's potential failure to meet the HAVA voter registration database requirements by the statutory January 1, 2006 deadline. These augmentations included:

- Establishment of interfaces to the State of California, Department of Motor Vehicles (DMV) and the Social Security Administration (SSA) to support verification of unique identifiers provided by registrants;

- Implementation of a process to obtain and apply ineligible-felon information from the California Department of Corrections and Rehabilitation (CDCR)

- Enhancement of the existing process to obtain and apply death records from the California Department of Public Health (CDPH);

- Creation of new automated processes to identify non-standard and invalid county data and to notify counties of required corrections;

- Enhancement of existing processes to support the use of United States Postal Service (USPS) National Change of Address (NCOA) data to check all registered voter addresses on a monthly basis;

- Addition of new data elements to the state database to store and process information required by HAVA and the National Voter Registration Act (NVRA);

- Modification of Calvoter to load inactive voter records from counties, and to edit those records;

- Automation of processes to upload county data changes at the end of each business day to ensure daily currency of the Calvoter database;

- Modification of adaptable (those that could be changed) existing county voter registration systems to include new required data elements, to support verification of voter identification through the California Department of Motor Vehicles (DMV) and SSA, to upload active and inactive records each day, and standardize data coding and formats; and

- Migration of existing non-adaptable (those that could not be changed) county voter registration systems to modified systems.

The following Figure III.1 describes the current business processes the Calvoter system supports.

Figure III.1 – Context Diagram for Calvoter System

CURRENT CALVOTER SYSTEM
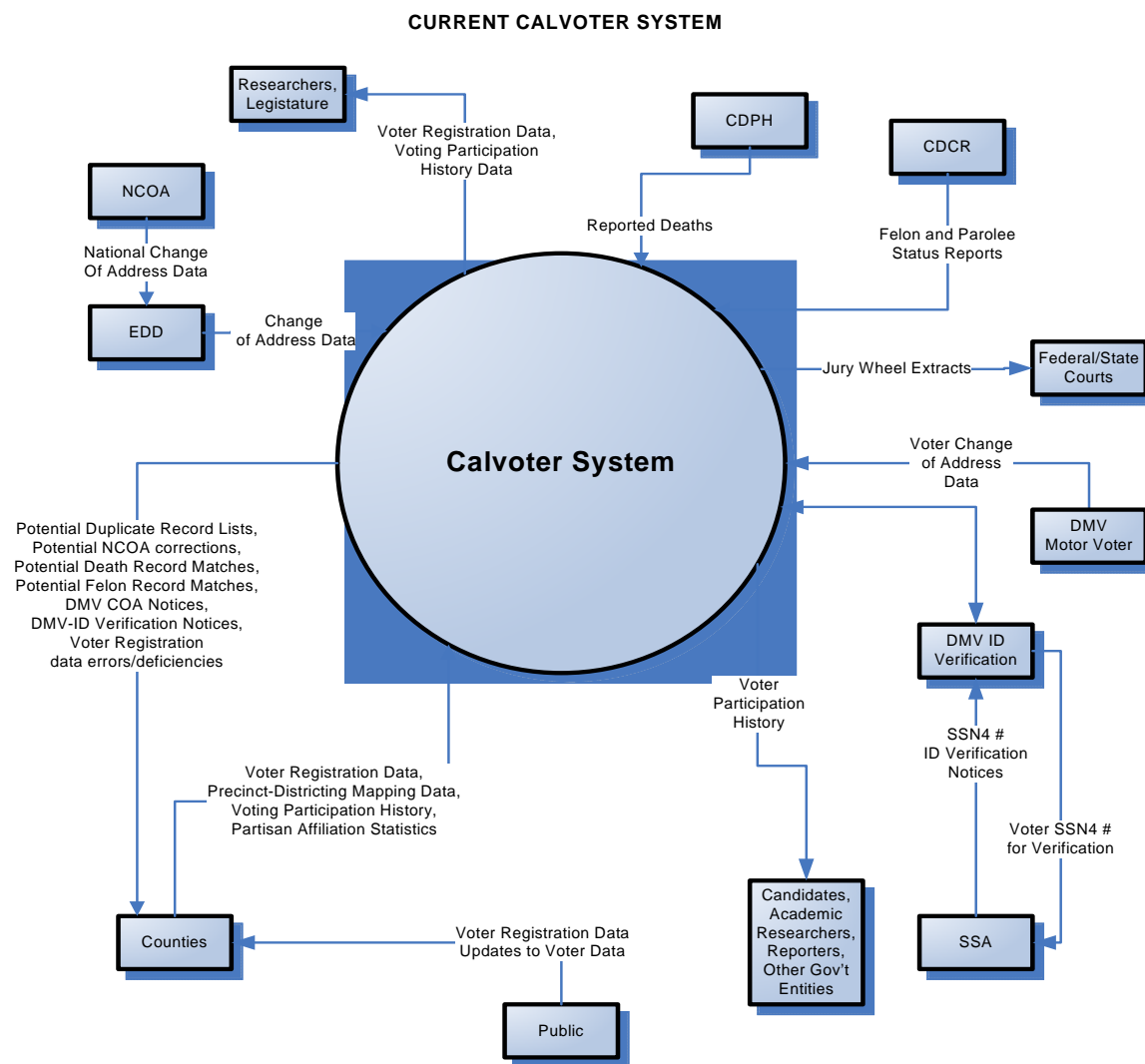
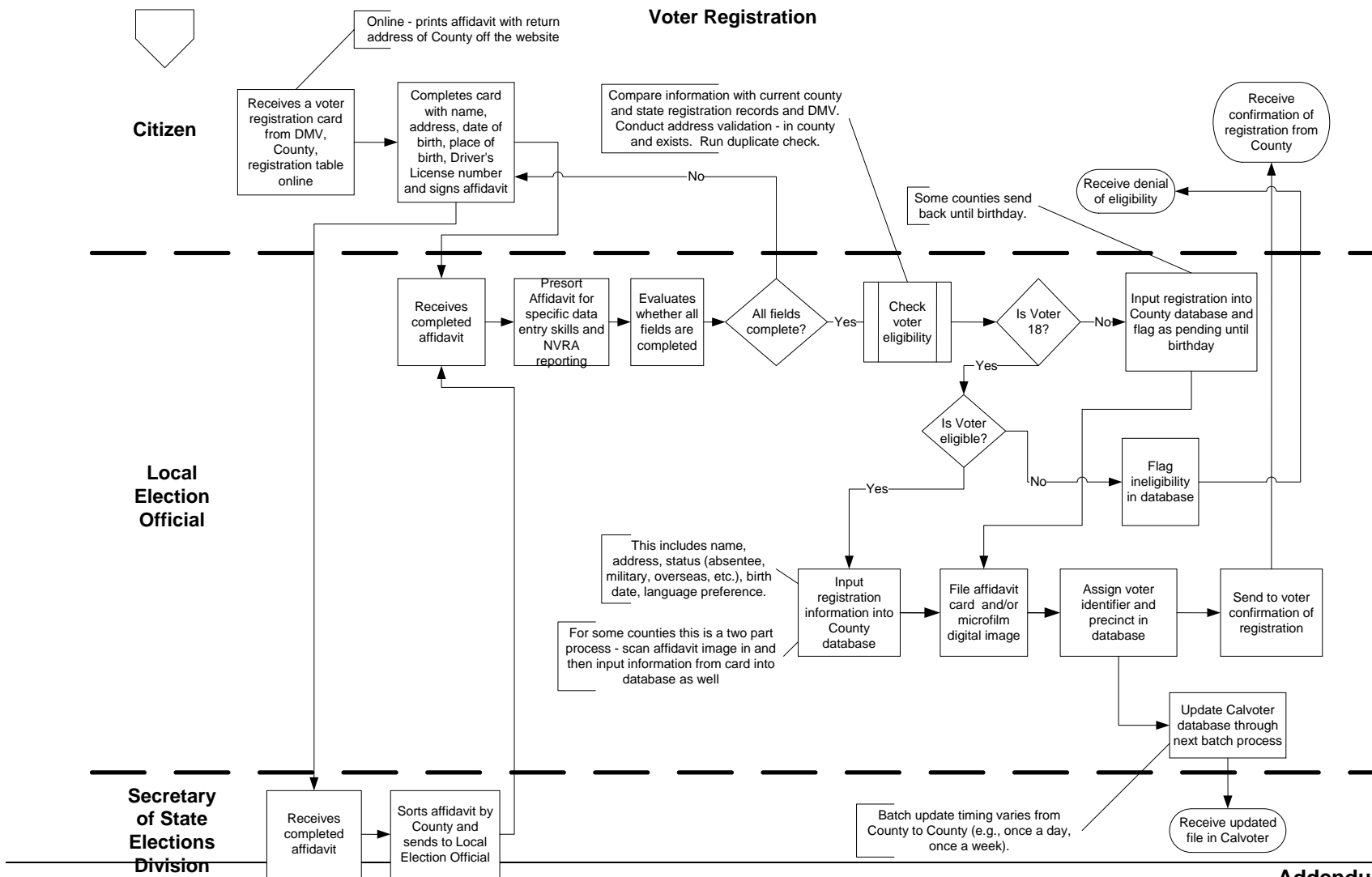

1. *Current Voter Registration Process*

   The registration process begins with the individual voter completing and signing an affidavit of registration and delivering it to the county elections official or the SOS by any of several delivery mechanisms, including:

   • Personal delivery to the county elections official or the SOS (SOS delivers to appropriate county);

   • USPS delivery to the county elections official or the SOS (SOS delivers to appropriate county);

   • Third-party delivery by registration drive or political campaign staff;

   • DMV program mandated by NVRA;

- Registration at federal, state and local agencies providing food stamps, services to the disabled, or through the Aid to Families with Dependent Children, Women/Infants/Children programs; and

- Alternative mail delivery services.

The following Figure III.2 depicts the typical steps involved in the voter registration process.

Figure III.2 Current Voter Registration Process

Voter Registration

Citizen

Online - prints affidavit with return address of County off the website

Receives a voter registration card from DMV, County, registration table online

Completes card with name, address, date of birth, place of birth, Driver's License number and signs affidavit

Compare information with current county and state registration records and DMV. Conduct address validation - in county and exists. Run duplicate check.

Some counties send back until birthday.

Receive confirmation of registration from County

Receive denial of eligibility

No

Local Election Official

Receives completed affidavit

Presort Affidavit for specific data entry skills and NVRA reporting

Evaluates whether all fields are completed

All fields complete?

Yes

Check voter eligibility

Is Voter 18?

No

Input registration into County database and flag as pending until birthday

Yes

Is Voter eligible?

Yes

No

Flag ineligibility in database

This includes name, address, status (absentee, military, overseas, etc.), birth date, language preference.

Input registration information into County database

File affidavit card and/or microfilm digital image

Assign voter identifier and precinct in database

Send to voter confirmation of registration

For some counties this is a two part process - scan affidavit image in and then input information from card into database as well

Update Calvoter database through next batch process

Secretary of State Elections Division

Receives completed affidavit

Sorts affidavit by County and sends to Local Election Official

Batch update timing varies from County to County (e.g., once a day, once a week).

Receive updated file in Calvoter

2. *Voter Registration List Maintenance Process*

Duplicate, changed and invalid registrations are identified using any or all of the following means:

- Residency confirmation mailings;
- Use of the NCOA information provided by the USPS through private vendors;
- Notification from the CDPH and/or the county Registrar of Births and Deaths of the death of a registrant;
- Change of address notification and other voter information from the DMV and other state and federal agencies as designated under the NVRA;
- Notification from other jurisdictions that a voter has reregistered in a new location;
- Direct notification from individual voters that they have moved to another jurisdiction or otherwise changed their registration information;
- Notification from CDCR and federal courts of individuals convicted of felonies and sentenced to prison; and
- Receipt of any official mailing returned by the USPS as undeliverable.

Batch processes are used to transfer data files from DMV, CDCR and CDPH to the Calvoter system and then to convert the files from their native formats to an acceptable format for further processing by the Calvoter application. The Calvoter system then attempts to match each record against existing records in the Calvoter database. The records are parsed into files for the appropriate county together with the registration ID of any matching registrants that are found. These files from the Calvoter database are then transferred to the counties via a batch process where counties must evaluate the notices and make appropriate changes to their voter registration records.

The following Figure III.3 depicts the typical steps involved in the voter registration list maintenance process. Actual activities may vary by county implementation.

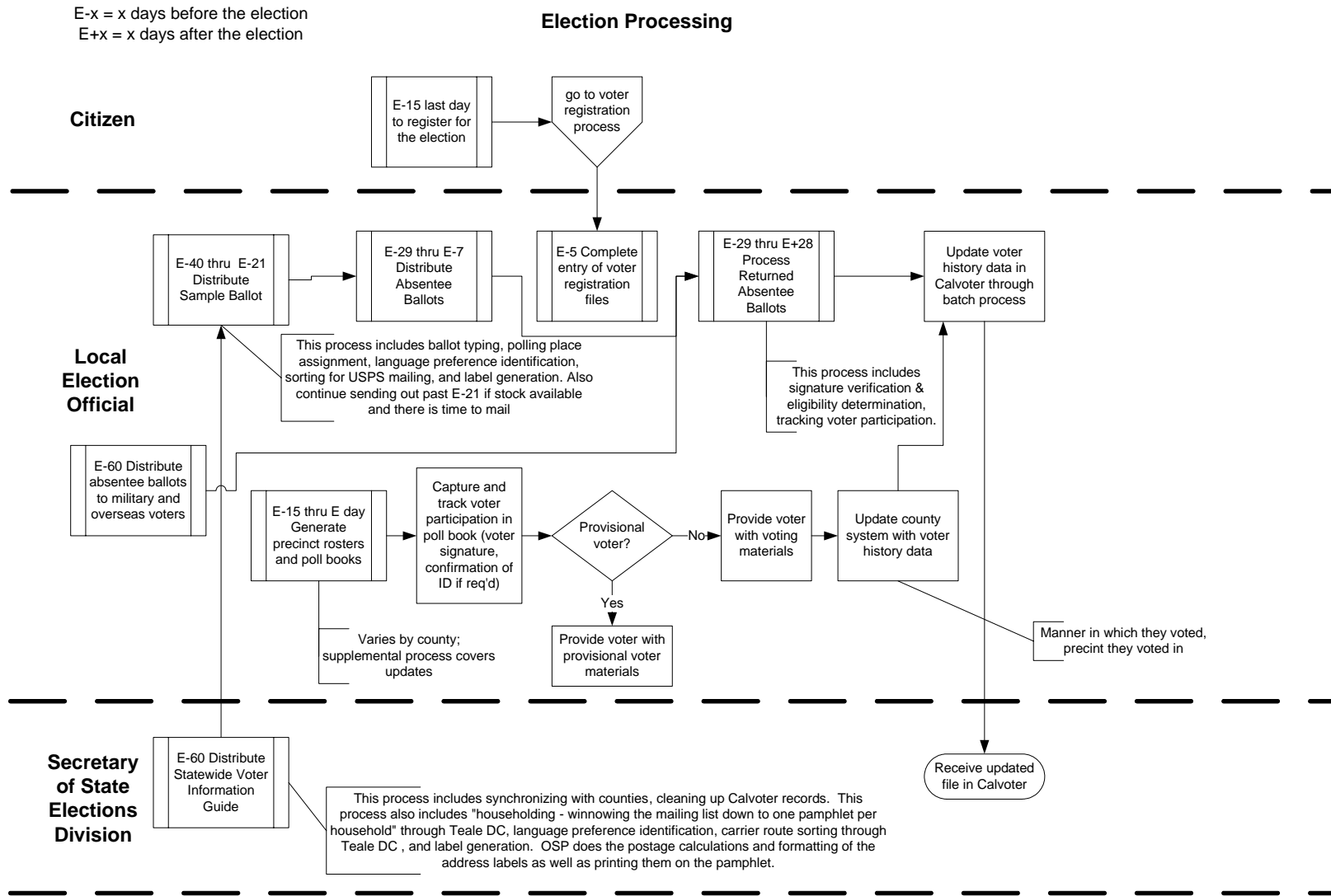**Figure III.3 Current List Maintenance Process**

List Maintenance
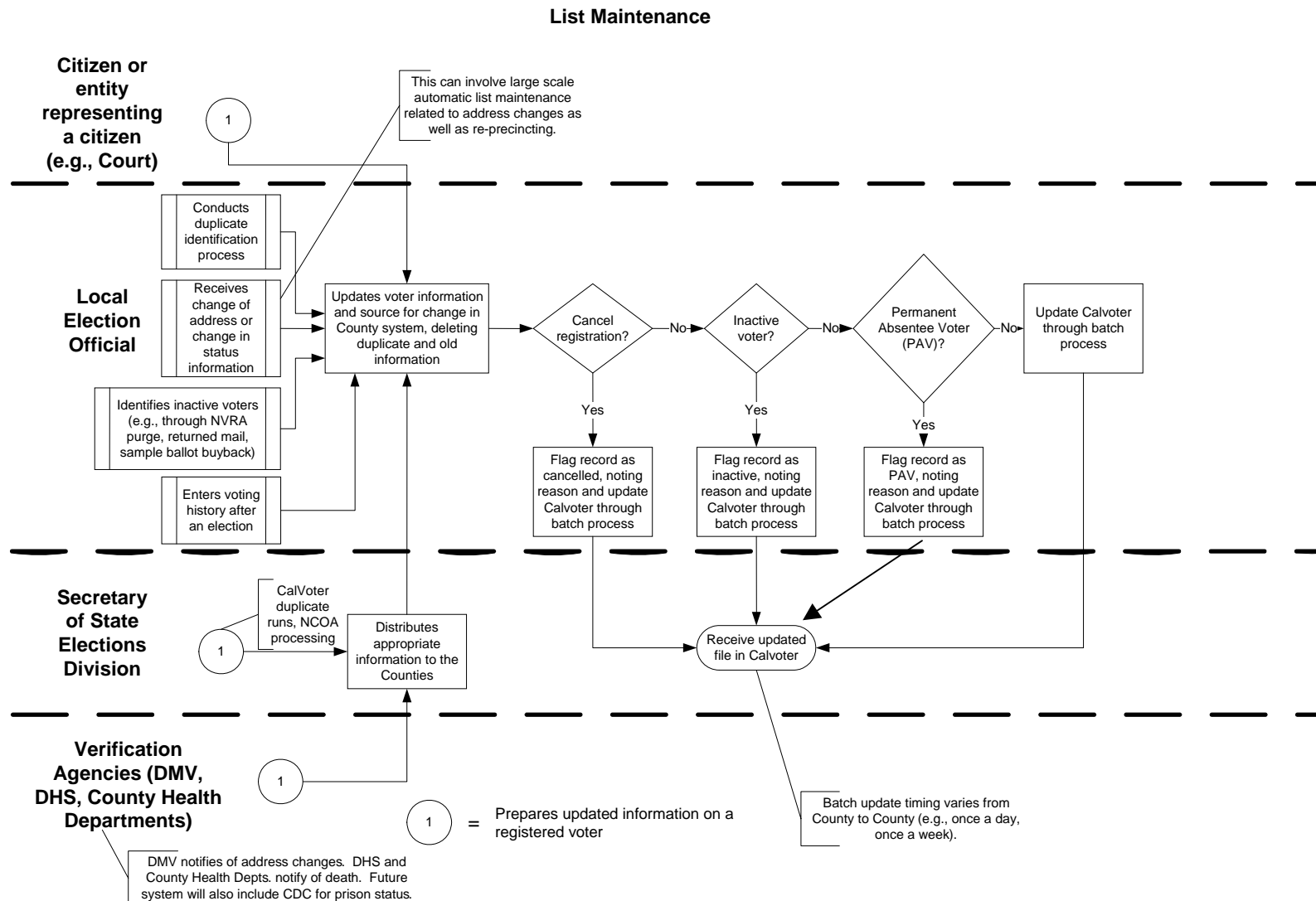
3. *Election Processing Activities*

Voter registration information is critical to election processing activities conducted by the State and County election officials. This information must be made available to election officials 24 hours a day, seven days a week during critical election cycles that require the mailing of voter information guides and ballot materials, printing of precinct rosters and poll books, processing of absentee ballots, and tracking of voting history.

Figure III.4 depicts the typical steps involved in the election processing activities that most directly relate to the voter registration data. Actual activities may vary by county implementation.

Figure III.4   Current Election Processing Process

E-x = x days before the election
E+x = x days after the election

Election Processing

Citizen

E-15 last day to register for the election

go to voter registration process

Local Election Official

E-40 thru E-21 Distribute Sample Ballot

E-29 thru E-7 Distribute Absentee Ballots

E-5 Complete entry of voter registration files

E-29 thru E+28 Process Returned Absentee Ballots

Update voter history data in Calvoter through batch process

This process includes ballot typing, polling place assignment, language preference identification, sorting for USPS mailing, and label generation. Also continue sending out past E-21 if stock available and there is time to mail

This process includes signature verification & eligibility determination, tracking voter participation.

E-60 Distribute absentee ballots to military and overseas voters

E-15 thru E day Generate precinct rosters and poll books

Capture and track voter participation in poll book (voter signature, confirmation of ID if req'd)

Provisional voter?

No → Provide voter with voting materials

Update county system with voter history data

Varies by county; supplemental process covers updates

Yes

Provide voter with provisional voter materials

Manner in which they voted, precinct they voted in

Secretary of State Elections Division

E-60 Distribute Statewide Voter Information Guide

This process includes synchronizing with counties, cleaning up Calvoter records. This process also includes "householding - winnowing the mailing list down to one pamphlet per household" through Teale DC, language preference identification, carrier route sorting through Teale DC , and label generation. OSP does the postage calculations and formatting of the address labels as well as printing them on the pamphlet.

Receive updated file in Calvoter

C. BUSINESS PROBLEM AND OPPORTUNITIES

1. *Help America Vote Act (HAVA)*

On October 29, 2002, the Help America Vote Act was adopted by Congress and became law. Section 303 of HAVA (Public Law 107-252, 107th Congress) mandates that each state implement a uniform, centralized, interactive, computerized voter registration database that is defined, maintained and administered at the state level. This database must contain the name and registration information of every legally registered active or inactive voter in the state. Unlike California's current Calvoter database, this system will constitute the official record of all registered voters. It must serve as the single system for storing and managing the official list of registered voters in the state.

This centralized system must provide a functional interface for counties, which are charged with the actual conduct of elections, to access and update the registration data. Additionally, HAVA mandates the voter registration system coordinate electronically with the DMV, the CDPH, and the CDCR for identification and list maintenance purposes.

2. *Current System Problems and Issues*

Although the augmentation of the Calvoter system brought the system closer to compliance with HAVA, there remain a number of critical limitations that must be addressed to achieve full compliance. The following are the issues and problems with the existing system.

Table III.1 – Calvoter System Problems and Issues

HAVA Requirement	Calvoter Ability to Address Requirement
Single, Uniform, Official, Centralized, Interactive, Computerized List HAVA Section 303(a)(1)(A) requires that the State (through SOS) implement a computerized statewide voter registration list that is: single, uniform, official, centralized, interactive, defined, maintained and administered at the State level, and contains the name and registration information of every legally registered voter in the State.	The Calvoter system is distributed rather than centralized; i.e., each county maintains the official records for that county and sends only portions of its registration data to Calvoter. Because each county employs its own voter registration system, the data is heterogeneous rather than uniform as required by HAVA. Calvoter was not designed to serve as the single, official record of registration for the conduct of elections throughout the state – essentially the foundation of the entire election process. While Calvoter does contain a complete list of active and inactive registered voters, this list is also maintained in pieces within separate county voter registration systems. Counties update their registration information and periodically update the central Calvoter system in a manner that does not ensure the Calvoter information and county information are synchronized at all times. As a result, although the SOS maintains the "official" list, this list would likely be different from the whole of the lists maintained by the counties at any given moment. The data maintained within the Calvoter and county systems is not maintained in a uniform manner. Each county captures data in a variety of ways and has different definitions for the status of voters. For example, one county may store cancelled voters in their system, while another purges them. One county may parse addresses into separate fields, while another county maintains the information in one text string.

HAVA Requirement	Calvoter Ability to Address Requirement
	The interim enhancements enforce standards for how data is uploaded to Calvoter but it cannot ensure that data is actually stored in the county system in the same form, or that the records stored in the county system are all and only those records reflected in Calvoter.
Data Accuracy and Timeliness HAVA Sections 303(a)(2)(A) and 303(a)(4) require the system to include provisions to ensure voter registration records are accurate and updated regularly. List maintenance shall be performed by "the appropriate State or local election official" in accordance with NVRA provisions.	The Calvoter system was designed as a batch system and is not interactive. Counties upload and download information from the system using batch processes. In some cases, counties have no direct connection between the Calvoter system and their own county election management systems (EMS). They upload and download information to disks/CDs and then update Calvoter or their own election management files. As a result, there is a significant time delay between when voter registration information is updated and when these updates are applied to the central State database. The interim enhancements added processes to ensure that Calvoter exactly reflects county systems at the beginning of each business day; however, this requirement is deliberately bypassed during the period surrounding federal elections that are closely followed by local elections. In addition, there are multiple voter registration processes and different data validation rules in each county and each county applies different processes and timelines to their list maintenance activities. Some counties conduct list maintenance activities and update their records on a real-time basis while others do so on a schedule that suits their particular business needs. SOS can use Calvoter with the interim enhancements to partially monitor county data, and through the data, the county business processes. However, the existing Calvoter environment cannot be used to enforce county business processes through the enforcement of data standards in the county systems.
Removing Ineligible Voters from the List HAVA Sections 303(a)(4)(A) and 303(a)(2)(A)(ii) require reasonable effort be made to remove ineligible voters from the voter registration list. For removing ineligible voters from the list, the State shall coordinate with: the DMV Motor Voter for address changes, CDPH for death notification, and CDCR for felony status.	Calvoter currently receives information from DMV, CDPH and CDCR and forwards it to counties for processing. No mechanism exists to monitor or enforce those county processes or ensure accuracy.

HAVA Requirement	Calvoter Ability to Address Requirement
Eliminating Duplicate Records and Ensuring Data Integrity HAVA Section 303(a)(2)(B) requires list maintenance to be conducted in a manner that insures: All legally registered voters are in the computerized list; only voters not legally registered or not eligible to vote are removed from the list; and duplicate names are eliminated from the list. In addition, HAVA Section 303(a)(4)(B) requires the State to employ safeguards to ensure legally qualified voters are not removed in error. List maintenance activities are to be conducted in accordance with NVRA provisions.	Calvoter was scaled to meet its original requirements. It currently stores only the most relevant and current data for approximately 20 million "active" and "inactive" registered voters. A HAVA-complaint system must store the complete voter registration data for all active and inactive voters, as well as historical data for previously registered voters. At this time, the State cannot meet this requirement. Counties use different voter registration processes and apply different data validation rules. They also apply different list maintenance activities at different times during the year. As a result, the amount of duplicate or erroneous registrations residing within county systems ranges from 1% to 52% (as reported by counties in a recent project survey). Most respondents indicated less than 10%. The interim enhancements allow the State to monitor the data uploaded by counties to Calvoter, and to partially monitor county business processes and data standards through that data, but cannot directly monitor nor enforce business processes or the data in the county systems. When potential duplicates and other voter registration changes are sent to the counties, (e.g. DMV change of address or potential matches with CDPH death records), they are cleared from the Calvoter system and there is no mechanism to track and verify that these notices are resolved.
Assignment of a Unique Identifier HAVA Sections 303(a)(5)(A)(i) – (iii) require all new (and renewing) registrants to provide their driver's license number (DL#). If they have no DL#, they must provide the last 4 digits of their Social Security Number (SSN). If they have neither DL# nor SSN, the system must assign them a unique identifier to use as a "voter registration ID number." No registration is valid unless/until the State verifies these ID numbers.	The interfaces to DMV and SSA to support the verification of the voter ID, which is the basis for the unique identifier, were added with the interim enhancements, as were requirements for the counties to assign a unique identifier based on the verified voter ID to all new and existing voter records. However, because the counties continue to maintain the 58 individual voter registration databases, it is not possible to ensure that voters are unique across the state nor to always identify duplicate voters upon registration. There is no mechanism for the State to ensure that voter IDs are correctly verified and applied. The State can use Calvoter to identify duplicate voters using the unique identifier supplied, after the data is uploaded from the counties, and it can notify the counties of the need to remove the duplicate record. However, Calvoter can neither prevent duplicates from being added in the first place nor enforce their removal.

3. _**Current County Practices**_

Currently, counties enter voter registration data into their systems either by key entry or by optical scanning with character recognition. Eventually batch files are created by their EMS and uploaded to the Calvoter system.

Counties periodically create extracts from their system as tab-delimited text files that contain transactions to update the Calvoter system with the changes that have occurred since the previous extract was created. A few of the county registration systems do not support the transactional update files; those counties can only send a full electronic copy of all their registration records that entirely replaces the records for that county in the Calvoter database.

Suggested changes to county data identified from DMV, CDPH, CDCR and NCOA processing, and from the system duplicate checks, are packaged into return files and sent to the counties for review and appropriate action. While most counties receive these notices as electronic transactions for direct import into their system, some receive them as printable reports that must be processed manually because their registration system does not support the electronic transaction import.

4. _**Current Data Exchange Protocol**_

Data exchanged between the Calvoter system and the counties is sent in tab-delimited text files based on the standard interchange format of 95 predefined fields negotiated with the counties. Because changes in this interchange format and its content require modifications to both the Calvoter system and each county EMS, this format cannot currently be easily changed to meet new data requirements if and when they occur.

Data transfers between the Calvoter system and the counties, as well as other agencies, are handled by a system of scheduled FTP batch processes. Applications that reside on the Calvoter file server control the flow of Calvoter files into, and out of, designated directories on the county workstations ("In-Box" and "Out-Box" directories). Calvoter files consist of registrant transaction files, voting history files and precinct/district files, which are manually launched for processing in the Calvoter application. The designated Calvoter System Administrators are the only individuals with authority to process these files into the Calvoter database. Figure III.5 depicts the file transfer process to, and from, the county voter registration systems and the Calvoter database.

Figure III.5 Current Calvoter Electronic Data Exchange Diagram
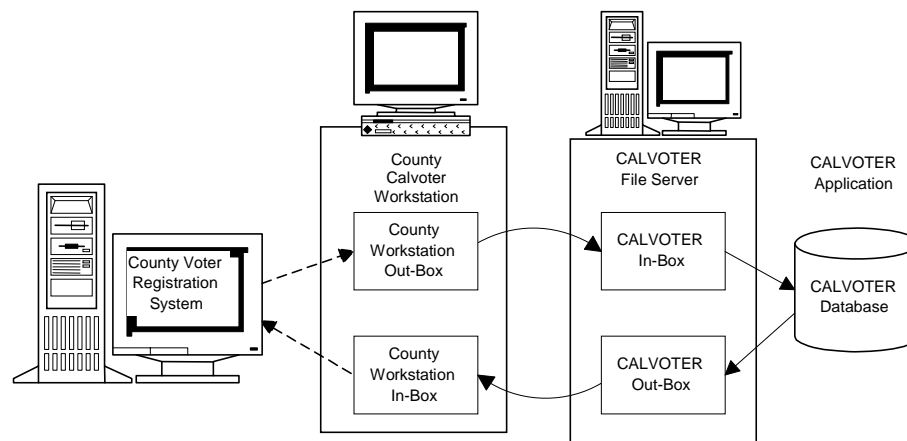
5. *Calvoter System Limitations*

    While counties have a windows-based Calvoter interface available for their use, it is limited to the following functions:

    - Ability to search and view registrant records across the entire state; and

    - Direct key entry of Report of Registration (ROR) statistics.

    The system has no direct ad-hoc reporting capability. The few reports built into the system are pre-programmed and can only be modified or reformatted by the vendor. There is limited capability to filter the data in these reports.

6. *Data Characteristics*

    - Calvoter stores voter registration data for approximately 20 million active and inactive registered voters.

    - Calvoter captures history of a voter's participation in previous statewide elections. However, the amount of historical data varies from county to county. Some counties have submitted data as far back as 10 years, while others do not electronically capture or report historical data to Calvoter at all. Currently, when a registrant is deleted from the system (e.g. when a registrant moves from one county to another), all historical data for that voter is permanently lost during the process of cancelling the old registration from the previous county.

    - Calvoter standards have been assigned for many data fields that are not natively validated or enforced by Calvoter. These fields include:
        - ✓ Name suffix and prefix
        - ✓ Gender
        - ✓ Residence address information
        - ✓ Mailing address information
        - ✓ Place of birth

    For example, if the Street Address field is defined to have 70 standards for street name (e.g. Blvd, Rd, Road, St, etc.) there may be up to 350 different variations in the system. Further, depending on the capabilities of the county registration system, many data fields are simply not populated.

7. *Security, Privacy and Confidentiality*

    Access to the application and its capabilities to review confidential data is strictly controlled by user accounts and assigned roles and enforced with encrypted passwords.   A 60-day timeout is enforced on user passwords. Security roles are fully customizable to ensure individuals are restricted to the appropriate level of information.

    County access to the Calvoter system, as well as transmission of data, is restricted to run over the private Calvoter wide area network (WAN) that is administered by Department of Technology Services (DTS). Many of the counties have chosen to deploy the application to their users by providing connectivity from their LANs to the Calvoter WAN; however, the method of connecting is restricted to one of the approved secure methods. The Calvoter system is not accessible via the Internet.

D. CUSTOMERS AND USERS

Customers of the State's voter registration Calvoter program include voter registrants and authorized recipients of the data (those requests for data initiated with public service requests). Users of the State's voter registration Calvoter program data include customers, internal SOS staff and management, local county election staff, external stakeholders, and partner agencies. Currently, only

local county election staff interfaces directly with SOS through the Calvoter system. Interfaces between SOS and its other customers and data users rely primarily on data extracts on electronic media such as CDs. Descriptions of customers and users and their need for State voter registration data are provided below.

1. ***Customers***

    Customers include voter registrants who rely on county elections officials to process their voter registration affidavits quickly and accurately so that they may vote in federal, state and local elections. Customers also include certain entities who are authorized by law to obtain voter registration data:

    - Candidates for federal, state, and local office
    - Political parties
    - Statewide Database Project at UC Berkeley (for redistricting)
    - Ballot measure proponents/opponents
    - Journalists
    - Academic researchers
    - Other government agencies

    These customers rely on the accuracy and timeliness of current and historic voter registration information for mailings, redistricting, media publications, and academic studies.

2. ***Users***

    The following are the primary users of the Calvoter system:

    - SOS staff (system end users) and management rely on system information to perform daily work activities in support of mandated voter registration and election management responsibilities. SOS Elections Division managers rely on system information to ensure that voter registration and list maintenance activities are performed in accordance with federal and state laws and regulations. Elections fraud investigators rely on system information to identify and investigate potential violations of voter registration and election law.
    - County Elections staff (system end users) and management support the Calvoter system as the mandated official statewide voter registration list by ensuring that data in the Calvoter accurately reflects the data in the county systems. County elections officials use the state system to verify voter identification information and identify voters whose eligibility has changed due to relocation, death or felony conviction.
    - External stakeholders include the Legislature, judicial districts, and other state and local governmental agencies interested in voter registration information. For example, judicial districts use voter registration data for jury pool processing (creating jury wheels).
    - Partner agencies include the DMV, CDPH, and CDCR. Currently DMV and CDPH exchange information with SOS regarding address and death verification information related to voter registrants. The State uses CDCR data to identify persons who are ineligible felons as defined by the California Elections Code. The State verifies with DMV the validity of any driver's license identification or, through DMV to the SSA the last four digits of the SSN provided by a registrant.

3. ***Current SOS Organizational Structure***

    SOS's organizational structure is depicted in Figure III.6. Staff from the Elections Division within the SOS will be involved in all phases of the VoteCal project, including requirements definition, testing, training, change management, and implementation. Figure III.6 following shows how the Elections Division fits within the overall structure of SOS.

Figure III.6 SOS Organization
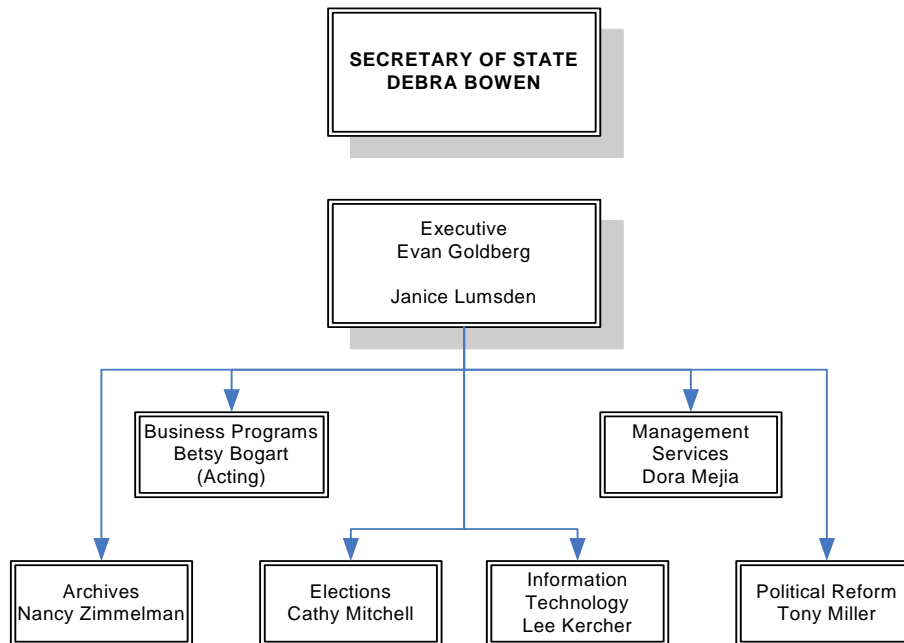
The Information Technology Division (ITD) will be closely involved in the VoteCal project. The Chief Information Officer is Project Director and a Steering Committee member. Additionally, ITD has hired a project manager to support the project full time, and has designated a separate full-time project lead. Other ITD staff will participate in all phases of the project as appropriate. Figure III.7 illustrates the ITD organizational structure.

Figure III.7 INFORMATION TECHNOLOGY DIVISION
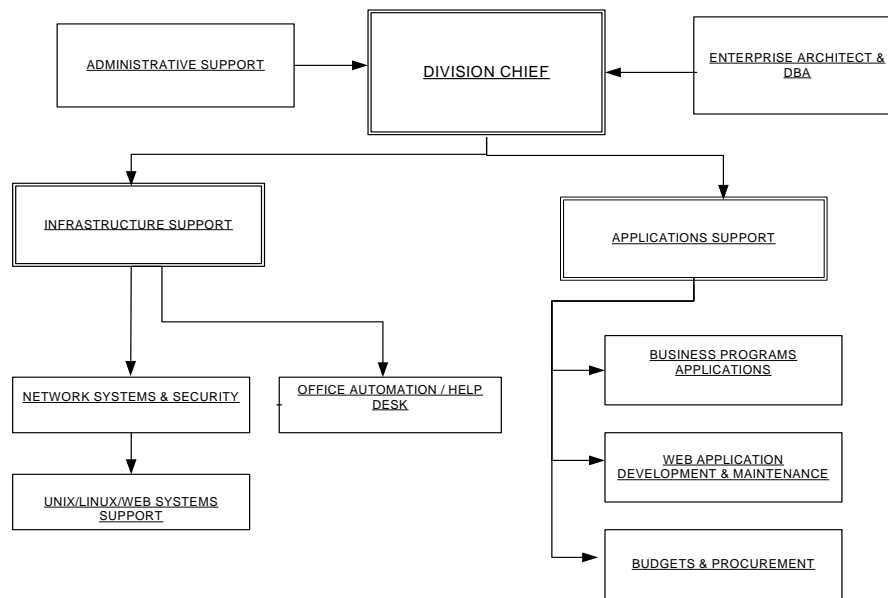
4. *Current Workload Statistics*

The following are the workload statistics for the Calvoter system.

Table III.2 Business Transaction Volume Information

Description of Transaction Volume	Volume Number
Number of counties sending data to Calvoter	58
Current Calvoter database registration record count (approximately)	20,500,000
Number of update transaction files processed daily	Average 36 files/day

E. CURRENT TECHNICAL ENVIRONMENT AND EXISTING INFRASTRUCTURE

1. *SOS Information Technology Staff*

The SOS maintains the Information Technology Division to provide support services to the department. The ITD is responsible for agency local area network (LAN) administration as well as PC support and database administration.

The division currently has 35 staff, including Staff and Associate Programmer Analyst (Specialists) and Associate, Staff and Senior Information Systems Analysts and System Software Specialists.

SOS utilizes the staff of the Department of Technology Services (DTS) Gold Camp Data Center Campus (GCDC) to support the mainframe and the connectivity of external departments utilizing the Calvoter system, as well as to maintain the Calvoter WAN between the SOS and the counties.

2. *Calvoter Computing Environment*

The SOS servers that interface to the GCDC mainframe are currently housed at the SOS.

a. Hardware Environment

The Calvoter servers at the SOS office have the following characteristics and capacity:

- Digital Equipment Corporation (DEC) AlphaServer 8200 5/440 Dual-Processor System
- 437 MHz
- 5-slot System Bus
- System I/O module with one I/O channel, two twisted pair 802.3/Ethernet ports, and three FWD SCSI ports
- 2 GB RAM
- 120 GB disk storage
- 2.1 GB SCSI disk
- 600 MB CD ROM Drive
- Internal Storage Drawer
- Two SCSI RAID Array Controllers

b. Software Characteristics

The Calvoter front-end interface has been developed in PowerBuilder (PowerLock 5.0).

As part of the interim solution, SOS developed a preprocessing application component of Calvoter that interfaces with the System Scheduler and Monitor (discussed below). This application performs preprocessing of data incoming from county uploads. The basic components of the system software characteristics are as follows:

- SQL Server; and
- Data processing (modules written in .NET).

The core of the Calvoter system is the Central Voter Registration Database, a proprietary client/server application owned by Election Systems & Software (ES&S). A separate application, System Scheduler and Monitor, was custom developed by Computer Resources Group/Radian International to schedule and manage the FTP transfer of data files between the SOS and the counties. Additionally, this application handles the transfer of files from other State agencies and then converts the data from its native format to the Calvoter transaction format. The basic components of the system software characteristics are as follows:

- Database management software (DBMS): Oracle (v. 9i)

- Data processing: modules written in Brio SQR

- Front-end interface has been developed in PowerBuilder (PowerLock 5.0)

c. Internal and External Interfaces

The primary interface with counties is the exchange of batch data files in the Calvoter file formats via FTP transfer. The internal interfaces include the SOS Elections Division staff and the SOS ITD. Both divisions' responsibilities are listed in the table below. External interfaces include:

- Access by the 58 counties to conduct file transfers;

- Data updates from CDPH and CDCR in order to help maintain the voter registration records;

- Data exchange with DMV to verify voter ID information (DL and the last four digits of the SSN [SSN4]);

- Data exchange with EDD to compare registration records against the NCOA database; and

- Registration update data from various agencies to update voter registration records.

Table III.3 Overview of Internal and External Interfaces

Internal	External
SOS Elections Division staff: • Use Calvoter to carry out their election-related responsibilities • Responsible for batch imports and exports, as well as data processing SOS ITD staff who are responsible for maintaining the Calvoter infrastructure	The 58 counties who use Calvoter through their county workstations
Files sent from counties to SOS	**Files sent to counties from SOS**
Voter registration changes (additions, corrections and deletions)	DMV change of address information
Voter participation history	CDPH death certificate information
Precinct to district mapping	NCOA address updates
Report of Registration statistics	CDCR potential felon notices
	Potential duplicate registrant notices

    d.   External State Interfaces

In Calvoter, SOS level interfaces capture the data supplied from the DMV, CDPH, CDCR, and the NCOA data from the Employment Development Department (EDD). This data is converted into transaction records that are loaded into the Calvoter database.

For DMV, CDCR, and CDPH, data is transferred to the SOS via the LAN connection to DTS and then a list of automated programs:

- Loads the data received into temporary Oracle tables;
- Checks the data for some basic validation;
- Re-formats the data into a file of transaction records to be loaded into the Calvoter database; and
- Informs the Systems Administrator that a new file of transaction records is ready to be loaded.

This process occurs only if data from DMV, CDCR, or CDPH is available to be loaded.

The DMV and CDPH data in transaction record format is then processed through Calvoter to match against existing registrants. When a match is found, the registrant ID number from the database is included in the transaction record field for that data item. If no match is found, the field is left blank. The balance of the transaction record contains the data received from the DMV, CDCR, or CDPH. All transaction records for DMV, CDCR, and CDPH data are then sent to the appropriate county.

For NCOA processing, an extract of county registrant data is created from the Calvoter database and then FTPed directly to EDD. The results returned from EDD are transferred back via FTP as well. The return data is evaluated against the registrant data in Calvoter and then transferred to the respective county as appropriate.

An additional interface exists between SOS and DMV through a separate application, CalValidator, developed in-house to verify voter DL and SSN4 numbers. Counties transmit

electronic requests for verification of the ID number provided by the voter. This transaction is forwarded to the DMV for verification of the DL provided or, if no such number was provided, the system attempts to identify a DL for the voter. For voters who provide their SSN4, DMV also forwards the electronic verification request to the Social Security Administration for verification. The DMV/SSA verification responses are sent back by DMV to CalValidator, which forwards them to the requesting county in turn.

Table III.4 Calvoter Interfaces with External Agencies

Interfaces are limited to FTP transferred files in predetermined formats:
DMV: Transaction verification of voter DLs and SSN4s
CDPH: Periodic transfer of death certificate information from CDPH to SOS
CDCR: Periodic transfer of felon information from CDCR to SOS
EDD: Upon county request, an extract of the county's data is created from Calvoter and sent to EDD for NCOA processing. The return data is sent back to SOS for processing through Calvoter.

e. County Interfaces

The second key component of Calvoter is the county interface. The county interface handles all functionality associated with the management of transaction records that are stored on the county workstations for processing.

Each of the 58 counties has a county workstation installed on its premises that has been provided by, and is the property of, the SOS. The county workstations provide a point of access to Calvoter by county staff. These workstations provide the following capability:

- Storage of transaction records
- Inquiry into the Calvoter database for registrant search
- Manual entry of ROR statistics (if not sent using transaction records).

Each county has its own system for managing its voter registration data independent of the Calvoter database and the county workstations. The systems that the counties use, or are expected to be using, during the development of VoteCal are listed below.

Table III.5 Existing County Voter Registration Software Products

Number of Counties	Vendor
3	ES&S – Develop and support Mega Profile and LEMS (Local Elections Management System)
30	DFM Associates – Develop and support EIMS
20	DIMS – Develop and support DIMS Net2000
2	Votec - Develop and support VEMACS
1	Sequoia Pacific – Develop and support Integrity System
2	Non-Commercial Off-The-Shelf (COTS) systems developed specifically for and supported by the individual county staffs or their contractors

f.   System Documentation

The following documents regarding the Calvoter system were created in the initial project development:

- Software Requirement Specifications (SRS) for the database, including the county and the state agency interfaces;
- Software Design Descriptions (SDD) for the county and the state agency interfaces; and
- System Manual providing detailed information regarding functions, requirements, and operations of the system.

While these documents are very thorough and complete, they have not been revised as the system has evolved. Additionally, the vendor for the proprietary core application does publish a high-level "user's guide" that explains operation of the graphical user interface (GUI). This document has been revised as the program has been updated.

g.   Desktop Workstations

The following tables display the typical new workstation configuration for staff at the SOS offices as well as the configuration for the Calvoter workstations at the counties.

Table III.6 Current SOS Desktop Workstations

Configuration
Dell OptiPlex GX270, small desktop
2.80 GHz
Pentium 4
512MB Memory
Dell UltraSharp 1901FP Flat Panel Monitor
64MB, NVIDIA, GeForce 4MX graphics card
Floppy drive
Integrated Intel Gigabit NIC, 10/100/1000
48X/32X/48X CD-Rewritable Drive
Integrated Sound Blaster
Internal Chassis Speaker Option
40GB EIDE, 7200 RPM hard drive

Table III.7 Current County Calvoter Desktop Workstations

Configuration
DELL Optiplex GX110
Pentium 3
800 MHz
256 MB Memory
10GB hard drive
17" monitor

h. Printers

SOS printers are either locally attached to workstations or are network printers. SOS does not have PostScript printers. The size and speed of the printer is based on the users' needs.

i. LAN Servers

Access to or by Calvoter is as follows:

*   For SOS staff, via the LAN;

*   For DMV and CDPH data, via the LAN connection to GCDC; and

*   For NCOA, via an FTP connection to the EDD.

The SOS Elections Division staff uses Calvoter to fulfill their election-related responsibilities and to conduct batch imports and exports of voter registration files. The SOS ITD staff is responsible for maintaining this network along with Calvoter.

Figure III.8   LAN/WAN Diagram
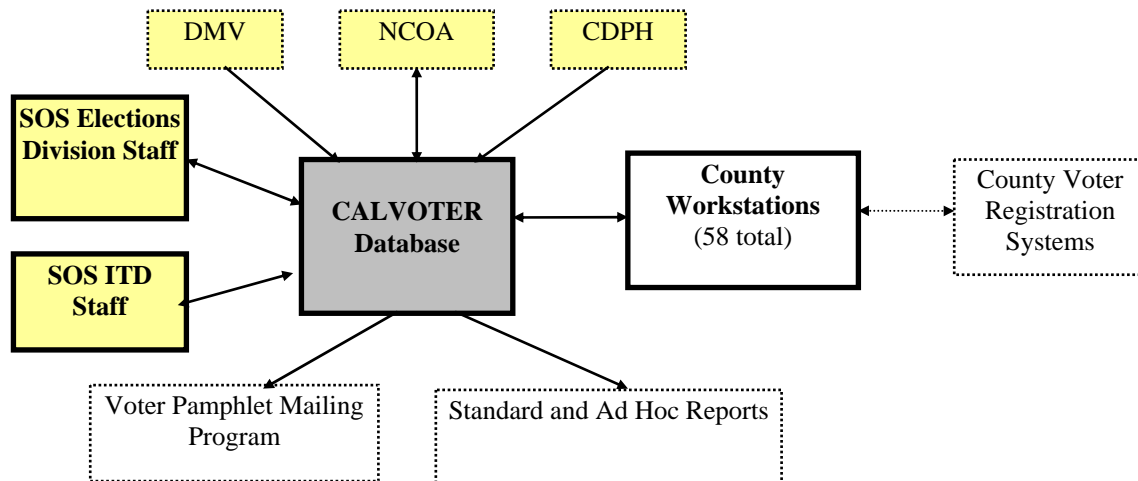
j. Network Protocols

There are a variety of standards employed in the network area due to the nature and complexity of data communications. The specific standards established at SOS include TCP/IP as the standard transport protocol for network traffic both inside and outside of the Agency. The ITD supports SNA and TCP/IP data communications to TCP/IP connectivity to the datacenter and TCP/IP connectivity to external business clients. DHCP[1] is used for TCP/IP addressing on all SOS LAN-connected workstations. Currently, Microsoft Windows Server 2K is used for networked fileserver services. All SOS servers are statically addressed.

SOSPROD (SOS production environment) is connected to the SOS network through 100Mbps Ethernet and all cabling within the SOS building is Category 5, which is capable of 100Mbs transfer using CDDI[2] or related technology.

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[1] Dynamic Host Configuration Protocol (DHCP) is software that automatically assigns IP addresses to client stations logging onto a TCP/IP network
[2] Copper Distributed Data Interface (CDDI) is a version of FDDI that uses UTP (unshielded twisted pair) wires rather than optical fiber.

The Calvoter network security architecture is shown in Figure III.9. The Calvoter system is protected by two firewalls. These firewalls separate the network into three environments:

- *The External Network,* which is the network available to the internet community;
- *The Semi-trusted Environment,* which exists between the two firewalls; and
- *The Closed Environment*, which is the internal SOS LAN within the internal firewalls.

The outer firewall is connected to the external network through a router, which restricts incoming network traffic to selected addresses or subnet masks. Between the two firewalls, in the semi-trusted environment, are two NT servers used by Calvoter for user and workstation authentication. These servers act as proxy servers for SQL*Net, FTP services, and e-mail.

CISCO brand routers are used for all WAN connectivity and Cisco brand switches for LAN connectivity.   This configuration prevents anyone in the external network from directly accessing the Calvoter system. The WAN is divided into three physical parts show in Table III.8 below.

Table III.8 WAN Usage

Network Protocol Used
Network Protocol Used

County Network
    • TCP/IP Network
    • Cisco Router, Model 2508
    • 56 Kb dedicated Frame-relay link (48 counties) or T1 (10 counties)

PAC Bell Frame-Relay Cloud

SOS Network
    • TCP/IP Network
    • Cisco Router, Model 7505
    • Three T-1 connections

Figure III.9   Calvoter Security Architecture
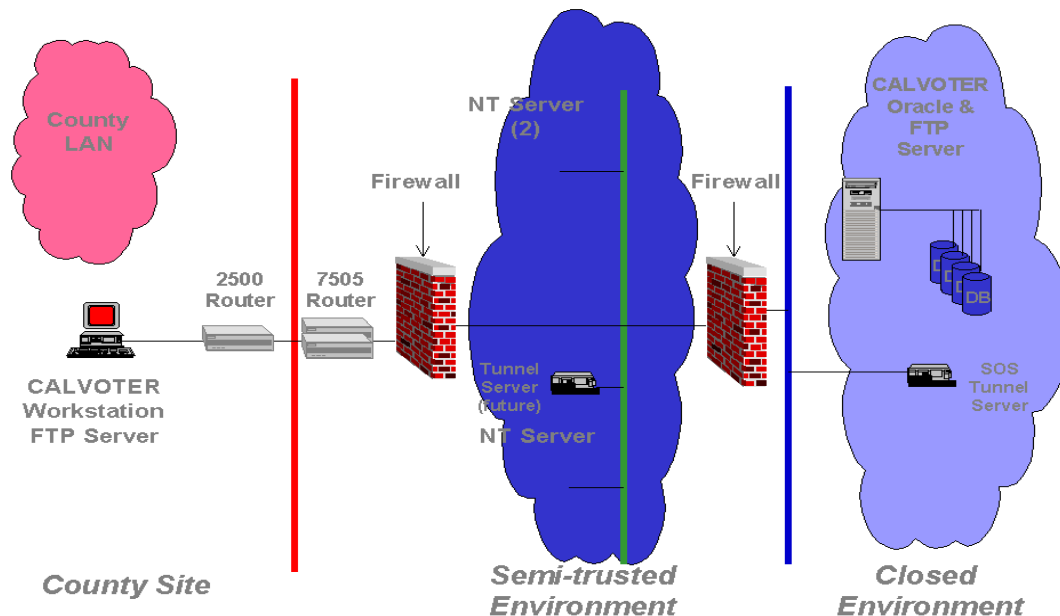
k. County Access

Each county workstation communicates with the Calvoter Database Server over a WAN. This WAN is a secure private network provided by the SOS and dedicated to data communication among the Elections Department and each of the County Registrar of Voters for the purpose of managing voter registration data.

Accessing the Calvoter database from a county workstation is a multi-step process. This process can be illustrated through an example of querying the Calvoter database from a county workstation. The query is first generated using the CVRDB application on the workstation. The county workstation communicates over the network through the first firewall to access the SQL*Net Proxy server, which is part of the semi-trusted environment. The SQL*Net Proxy server then communicates through the second firewall to the Calvoter database server, and sends the query to the Oracle DBMS. The Oracle DBMS executes the query on the Calvoter database and sends the results back to the SQL*Net Proxy server. The Proxy server, in turn, forwards the results to the requesting county workstation. The results of the query are then displayed within the CVRDB application on the workstation. At no time do the county workstations have direct access to the SOS LAN. The router restricts network traffic into the semi-trusted environment to selected IP addresses or subnet masks.

l. Application Development Software

The following table identifies the current Application Development Software platform at the Secretary of State's office for the various current applications.

Table III.9 Application Development Software Description

Application	Programming Language	Software
Cal-Access		
AMS	PowerBuilder 7.03, build 10135 Oracle PL/SQL	
Cal-Access	.NET Platform SP2 IIS 5	
CARES	ASP ASP, IIS 5	
Cal-Online	.NET Platform SP2 IIS 5	
Ca-Filer	C++, Pro C	
DB-Search	.NET Platform SP2 IIS 5 C+ Oracle PL/SQL	
Calvoter 1	PowerBuilder 9 SQL 8.2 Perl Java Oracle PL/SQL	PowerBuilder 9, SQR 8.2, Perl, Java, Oracle PL/SQL
Calvoter 2	JDK 1.4.1 Corba Crystal Report 8.5 Oracle PL/SQL Perl	
Domestic Partners	PowerBuilder 7.03, build 10135	
Notary		
NAP	PowerBuilder 7.03, build 10135	
Security Module	PowerBuilder 5 with Object Start	
PeopleSoft	SQR 4.3.4 MicroFocus COBOL 2.11 (server) BEA Tuxedo 6.5 PeopleTools 7.63	
SO E-File	ASP Crystal Reports 9.0	
BPA	ASP Crystal Reports 8.5 Visual Basic 6.0 BEST Argent Scheduler ExceedZip MS Word 2000 - SP1 MS Excel 2000 - SP1 UeWI Intelligent NameSearch Kofax Ascent RightFax VeriSign PayFlow Pro Software Artisans File Upload	

m. Operating System Software

The following table provides a description of the operating system software for the typical SOS workstation computer.

Table III.10 Operating System Software Environment

Software and Version
Windows 2000 with service pack 4
Internet Explorer 6.0
Oracle 9.2.0.1.0
Java 1.4.2
Remedy Client 6.0
Rumba 7.0
Microsoft SNA client 4.0
Citrix Client 7.1
Altiris
McAfee

n. Database Management System

All existing SOS Oracle databases are either Oracle 9.2.0.4. or SQL

o. Personal Productivity Software

The following table provides a description of the personal productivity software used by the typical SOS workstation computer.

Table III.11   Personal Productivity Software

Software and Version
Internet Explorer 6.0
Microsoft Office 2000 (Word, Excel, Power Point, Access & Outlook) with SP3
Acrobat Reader 6.0.1
WinZip 9.0
Visio Viewer
MS Project 2000 (used on some workstations)
MS Visio (used on some workstations)